Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-17. (Canceled).

18. (Currently amended) A method for protecting a surface ~~at one end~~ of a reaction chamber having two ends, a longitudinal axis therebetween and a chamber periphery remote from said axis, said surface being disposed at one end of the chamber, transverse to said axis ~~surface~~, said surface having a central area close to said axis and a periphery remote from said axis, the method comprising

introducing a primary flow of reactants into the chamber from said chamber periphery in a manner whirling around said longitudinal axis, and

axially withdrawing reaction products through an outlet disposed close to said axis and axially spaced from said surface towards the other~~at an opposite~~ end of the reaction chamber ~~in a flow along the longitudinal axis, whereby~~,

such that said primary flow and said flow of reaction products approximate a free vortex flow characterized by a negative pressure gradient increasing towards said axis, and

introducing at the periphery of said surface a secondary protecting flow directed ~~towards the central area of the~~ along said surface towards said axis, enabling thereby said pressure gradient created by said free vortex flow to keep said secondary flow non-separated from said surface substantially over its entire area.

19. (Previously presented) A method according to Claim 18, wherein said secondary flow is introduced in the chamber at a flow rate lower than that of the primary flow.

20. (Previously presented) A method according to Claim 18 or 19, wherein said secondary flow is free of any said reactants of the primary flow.

21. (Previously presented) A method according to Claim 18 or 19, wherein said primary flow comprises a working fluid and said secondary flow is free of said working fluid.

22. (Previously presented) A method according to claim 18 or 19, wherein said secondary flow is used to cool said surface.

23. (Previously presented) A method according to claim 18 or 19, wherein said primary flow is introduced into the chamber as a conical whirling jet flowing away from said surface.

24. (Previously presented) A method according to claim 18 or 19, wherein said primary flow is introduced into the chamber along an interior wall thereof.

25. (Previously presented) A method according to claim 18 or 19, wherein radiation absorbing particles are introduced into the chamber in order to elevate said primary flow's temperature and thereby initiate the reaction.

26. (Previously presented) A method according to claim 18 or 19, wherein said secondary flow is an inert fluid.

27. (Previously presented) A method according to claim 19, wherein the rate of said secondary flow is essentially lower than the rate of said primary flow.

28. (Previously presented) A method according to Claim 27, wherein the rate of the secondary flow is only a few percent of the rate of the primary flow.

29. (Currently amended) A reaction chamber having two ends, a longitudinal axis therebetween, a chamber periphery remote from said axis, and a surface to be protected disposed at one end of the chamber and orientated substantially transversely to said longitudinal axis,

said surface having a central area close to said axis and a periphery remote from said axis,

a primary ingress means for introducing a primary flow of reactants into the chamber from said chamber periphery in a manner whirling around said longitudinal axis,

an egress opening disposed close to said axis and axially spaced from said surface towards the other ~~at an opposite~~ end of the chamber for withdrawing reaction products from the chamber in ~~a~~an axial flow along the longitudinal axis, whereby said primary flow and said flow of reaction products approximate a free vortex flow characterized by a negative pressure gradient increasing towards said axis,

and a secondary ingress means for introducing at the periphery of said surface a secondary protecting flow ~~and~~ directed along said ~~ing it towards the central area of the~~ surface towards said axis, whereby said pressure gradient created by the free vortex flow keeps said secondary flow non-separated from said surface substantially over its entire area.

30. (Previously presented) A reaction chamber according to Claim 29, wherein the longitudinal axis passes through said egress opening.

31. (Previously presented) A reaction chamber according to Claim 29 or 30, wherein the surface to be protected is free of any fluid inlets formed therein.

32. (Previously presented) A reaction chamber according to Claim 31, wherein the surface to be protected is a transparent window adapted for admitting incident concentrated solar radiation.

33. (Previously presented) A reaction chamber according to Claim 32, capable of being associated with a solar radiation concentrator via said transparent window.

34. (Previously presented) A reaction chamber according to Claim 32, wherein said reaction chamber is shaped to approximate a black body radiation cavity.

35. (Previously presented) A reaction chamber according to Claim 29 or 30, wherein said chamber has walls that are capable of being heated up, and said primary ingress means are arranged so that said primary flow acts to extract heat from said walls prior to being introduced into said chamber.

36. (Previously presented) A reaction chamber according to claim 29 or 30, further comprising means for introducing in the chamber refractory material disposed so as to heat said primary flow of reactants.

37. (Currently amended) A reaction chamber according to claim 29 or 30, wherein said egress opening is disposed at

said other end of the chamber ~~axially extended towards said surface to be protected~~.

38. (Previously presented) A reaction chamber according to claim 29 or 30, wherein said secondary ingress means are adapted for introducing in the chamber said secondary flow at a flow rate lower than that of the primary flow.

39. (New) A reaction chamber having a longitudinal axis and a surface to be protected disposed at one end of the chamber and orientated substantially transversely to said longitudinal axis,

said surface having a central area close to said axis and a periphery remote from said axis,

a primary ingress means for introducing a primary flow of reactants into the chamber in a manner whirling around said longitudinal axis,

an egress opening disposed at an opposite end of the chamber for withdrawing reaction products from the chamber in a flow along the longitudinal axis, whereby said primary flow and said flow of reaction products approximate a free vortex flow characterized by a negative pressure gradient increasing towards said axis,

and a second ingress means for introducing at the periphery of said surface a secondary protecting flow and

directing it towards the central area of the surface, whereby said pressure gradient created by the vortex flow keeps said secondary flow non-separated from said surface substantially over its entire area,

wherein said egress opening is axially extended toward said surface to be protected.